

Amendment Under 37 CFR § 1.111  
Application No. 10/501,813  
Attorney Docket No. 042393

## **REMARKS**

### **Specification**

**The disclosure was objected to because of informalities.**

The specification has been amended to overcome the objection.

### **Rejections under 35 USC §112, Second Paragraph**

**Claims 6 and 7 were rejected under 35 USC §112, second paragraph, as being indefinite.**

Claims 6 and 7 have been amended to further clarify the claimed subject matter.

### **Double Patenting**

**Claims 1-7 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,979,392 B2.**

A terminal disclaimer has been filed herewith. Thus, the obviousness-type double patenting rejection has been overcome.

**Rejections under 35 USC §103(a)**

**Claims 1,2, 6 and 7 were rejected under 35 USC §103(a) as being obvious over JP 09-302496.**

JP 09-302496 discusses a method for plating chromium-containing alloy coating. It describes as follows:

[0014] The alloy composition obtained by using the plating bath is of 2-50 wt% Cr, 40-95 wt% Ni and/or Co, **3-50 wt% of** at least one selected from Mo, W and **Re**.

Thus, the alloy composition obtained according to JP 09-302496 contains only 3-50 wt% of Re, if any. JP 09-302496 is mentioned in the present specification as follows:

(3) Re-Alloy Electroplating Process

There have been known a Ni-Cr-Re alloy film having a Re content of up to 50 weight% (this percentage becomes lower when converted into atomic composition ratio), a Ni-Co-Re alloy film (see, for example, Japanese Patent Laid-Open Publication Nos. 09-302495 and 09-302496), and a Re-Ni alloy film for electric contacts, which has a Re content of up to 85 weight% (63 atomic%) (see, for example, Japanese Patent Laid-Open Publication No. 54-93453). In all of the above plated films, the content of Re is in a low level.

The present invention is directed to “a method for forming a **high-Re-content alloy film which contains Re at 98 % or more** by atomic composition.”

The composition of the solution according to present claim 1 is clearly different from that of JP 09-302496. JP 09-302496 explains as follows:

[0019] The concentration of **organic acid** in the plating solution, which depends on the combination of the organic acid and the metal ion, should be **0.3 to 3 equivalents**, especially preferably 0.3 to 2 equivalents to total metal ion concentration.

This description in JP 09-302496 teaches away from having the concentration of organic acid greater than 5.0 equivalents. Claim 1 specifically recites “at least one organic acid selected from the group consisting of carboxylic acid, hydroxycarboxylic acid and amino acid, in a concentration of **greater than 5.0 to 15.0 equivalents to the concentration of all of said metal ions.**”

The Examiner alleged that “changes [sic] concentration is not patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art.”

**The disclosure does show such new and unexpected results** which are different in kind. As shown in Fig. 1, the content of Re significantly increases as organic acid/metal ions increases from 3 to 5 equivalents. As explained on page 2 of the present specification, it is the inventor’s discovery through intensive researches on a Re electroplating process, that a Re alloy film having a Re content of 98% or more by atomic composition is formed by adding into an electroplating bath an organic acid having at least one functional group selected from the group consisting of a hydroxyl group, a carbonyl group and an amino group, and controlling at a concentration of greater than 5.0 to 15.0 equivalents to the concentration of all of said metal ions.

Nothing in JP 09-302496 teaches or suggests that a Re alloy film having a Re content of 98% or more by atomic composition is formed by an electroplating bath containing an organic acid having at least one functional group selected from the group consisting of a hydroxyl group,

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a carbonyl group and an amino group in a concentration of greater than 5.0 to 15.0 equivalents to the concentration of all of said metal ions.

For at least these reasons, claim 1 patentably distinguishes over JP 09-302496. Claims 2, 6 and 7, depending from claim 1, also patentably distinguish over JP 09-302496 for at least the same reasons.

**Claims 3-7 were rejected under 35 USC §103(a) as being obvious over JP 09-302496.**

Claim 3 has been amended to recite, among other things, “wherein the high-Re-content alloy film consists of Re in the range of 65 to less than 98% by atomic composition and the reminder being at least one of Ni, Fe and Co”

Thus, according to the present invention, the obtained alloy does not contain Cr. In contrast, JP 09-302496 describes that the composition of the obtained alloy contains 2 to 50% Cr (Abstract). Thus, JP 09-302496 does not teach or suggest that “the high-Re-content alloy film consists of Re in the range of 65 to less than 98% by atomic composition and the reminder being at least one of Ni, Fe and Co.”

For at least these reasons, claim 3 patentably distinguish over JP 09-302496. Claims 4-7, depending from claim 3, also patentably distinguish over JP 09-302496 for at least the same reasons.

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In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Sadao Kinashi", is written over the printed name.

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